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# Common Diseases of Beans and Peas

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Anthracnose of Beans

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# Common Diseases of Beans and Peas*

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The growing of beans and peas is a very important industry, especially at points in the southern part of the state which are accessible to the Philadelphia markets. The loss due to fungous diseases is very heavy and is the cause of many inquiries to the Agricultural Experiment Station. The purpose of this circular is to give the methods of preventing and controlling outbreaks of disease.

ANTHRACNOSE (*Colletotrichum lindemuthianum*) is the most common and most destructive of bean diseases. This is a fungous disease which is always prevalent on certain varieties of the wax, string or bush beans. It varies in severity with the character of the seed and with the weather. If the seed carries a large percentage of diseased beans, the attack will become severe earlier in the season than if the seed is comparatively clean. The disease is always more severe during a wet than during a dry season.

Anthracnose attacks pods, leaves and stems. The pod form (fig. 1) is the cause of the most inquiries and many growers fail to recognize the fact that the disease as it appears on the leaves and stems is the same as that on the pods. It starts on the pods as small dark spots which increase in size, sometimes coalescing, thus forming large, irregular, canker-like spots which are pinkish, reddish or orange in color but become black with reddish borders. On the leaves it appears as black spots along the petiole and veins, usually on the lower surface. The older spots are somewhat sunken and more nearly like those on the pods. On the stems (fig. 2) it appears as spots very similar to those on the leaves but usually elongated up and down the axis.

Anthracnose is carried on the seed (fig. 3) and can be detected by the dark brown or reddish spots. Therefore, it is evident that the use of clean seed is of great advantage in controlling this disease. It is claimed that seed grown in the dry, irrigated districts of the West carry less of this disease than seed grown in other places. The writer is inclined to believe that this is correct. However, it is not always possible to secure this grade of seed and the writer knows from personal observation that much of the seed put on the New Jersey market contains a high percentage of diseased beans.

* This circular replaces Circular 84, New Jersey Agricultural Experiment Stations. Photographs used for this circular were taken by R. F. Poole, Assistant Plant Pathologist.

If the grower cannot secure satisfactory seeds, free from spots, he will find it advantageous to hand-pick the seed carefully, throwing out all beans that show suspicious spots, and also all wrinkled and cracked beans. This practice will give a better stand and a better crop.

Fig. 1 Anthracnose on Bean Pods

The tiny spores which spread the disease are produced in very great abundance and are readily carried from plant to plant, especially when the plants are wet with rain or dew. If the field is

cultivated or the crop picked while wet, the spores cling to the farm implements and to the hands and clothing of the pickers and are

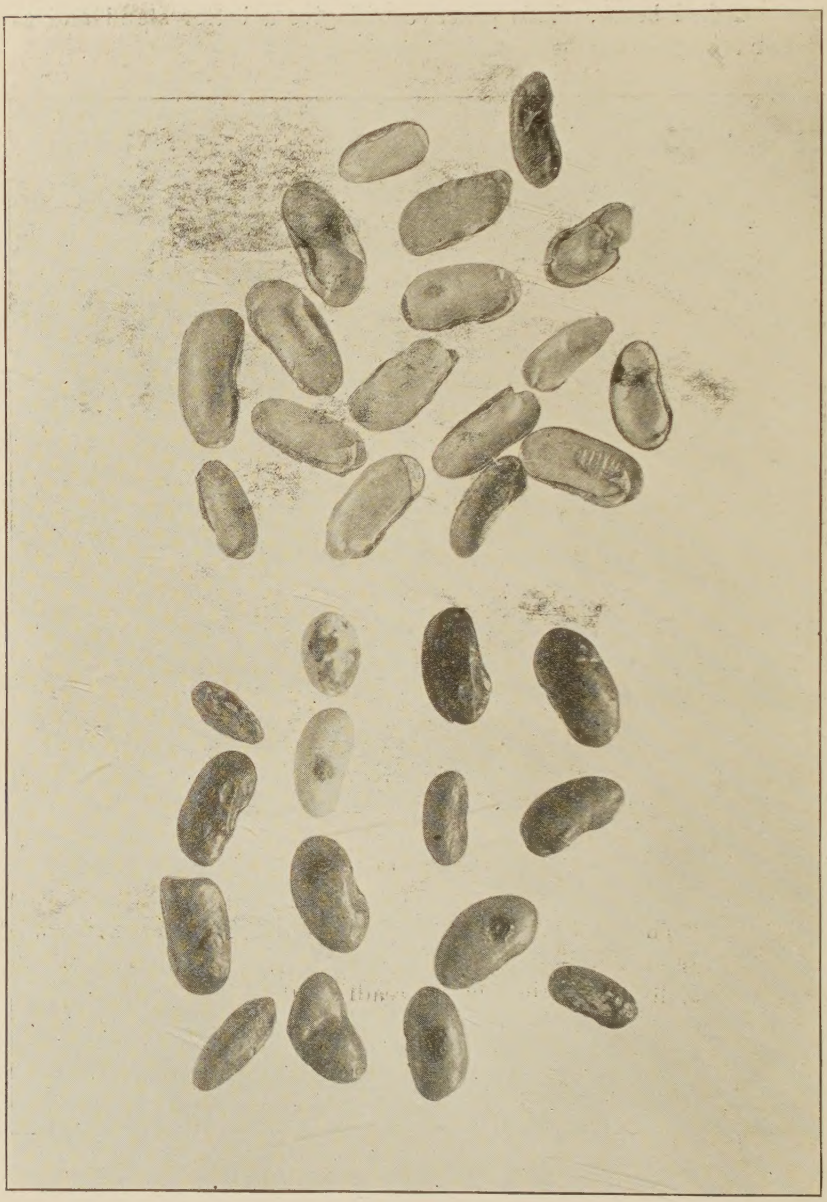

Fig. 2 Anthracnose on Bean Seeds

carried to the healthy plants. **Do not cultivate or pick beans while the plants are wet.**

The disease spreads from pod to pod after the beans are picked. Therefore, it is advisable to handle the newly-picked beans as little as possible and to market them as soon as possible.

Root Rots may be due to several causes. The *Rhizoctonia rot* is most common and is the cause of many complaints. This organism attacks a large variety of plants. In the case of beans and peas, it causes cankers on the roots and in severe cases destroys practically the entire root system. It is very frequently found with anthracnose.

Fig. 3 Lima Bean Pod Blight

The *sclerotinial rot* (fig. 4) is sometimes very destructive to beans and peas. It is due to a soil fungus (*Sclerotinia libertiana*) which attacks the plants at about the surface of the soil, causing them to wilt and die. It also attacks stems and pods and sometimes spreads from pod to pod after picking. In wet weather, this fungus sometimes grows as a dense white mold on any part of the plant. This organism is the cause of the lettuce drop, and also attacks a large number of other plants.

The roots of field peas are sometimes rotted by another fungus (*Thielavia basicola*). The damage to the roots causes the tops to wilt and die.

Still another fungus (*Fusarium sp.*) does similar harm to both beans and peas.

The fact that these organisms attack such a large variety of plants makes it very difficult to devise methods of control. Burning the rubbish after harvest, deep plowing, and the rotation of crops, using corn or other grain crops, is advantageous.

Beans which are planted early while the soil is cold and wet very frequently rot. Peas will survive a much lower temperature than beans.

Damping-Off is the name applied to the wilting and dying of many seedling plants. It may be due to any one of many fungi and is the cause of many complaints early in the season. The fungi causing this disease live in rich soils, especially those that have been highly manured. Under warm, wet conditions they attack the seedling plants at the surface of the soil causing them to wilt, fall over and die. It is not serious except in wet weather. Most of the damping-off diseases can be controlled by sterilizing the seed-bed as described in Circular 106.

Pod Blight and Leaf Spot of Lima Beans (*Diaporthe phaseolarum*) (fig. 5). This is a very common fungous disease which is the cause of heavy losses in the southern part of the state. The disease on the pods and on the leaves was originally supposed to be two distinct diseases. Mild forms of this disease reduce the market value and severe cases prevent the maturity of many pods.

On both pods and leaves it causes brownish or black spots of various sizes. It is usually most severe after wind storms when the vines are in fruit.

It is carried on the seed from year to year and during the growing season the spores are probably carried from plant to plant by the wind, by insects and by pickers.

The seed should be examined carefully and the dark, shriveled ones thrown out. It is also recommended that the seed be treated for 5 to 10 minutes in a solution of mercuric chloride (1—1000), or formaldehyde (1—100), or copper sulfate (1—100) and then rinsed in water. Spraying the growing plants with Bordeaux mixture has given good results.

Sun Burn. The leaves of beans, especially lima beans, cowpeas and soybeans, are frequently sunburned. This is most common when a wind turns the leaves so as to expose the under sides to the direct rays of the sun. The lower surfaces of leaves injured in this manner become very red.

Mosaic. This is a very common disease which causes the plants to be dwarfed and the leaves to be very much reduced in size. The

leaves are frequently crinkled and mottled.

Seed should not be saved from plants affected with this disease.

Downey Mildew of Lima Beans (*Phytophthora phaseoli*) is quite common throughout the state, especially in wet seasons. It is most severe in gardens where the beans are planted very close but is also very destructive in large field crops in wet seasons and foggy weather. It appears on the pods, buds, very young leaves and young shoots as a dense white mold.

It can be controlled by spraying thoroughly with Bordeaux mixture.

Fig. 4 A Natural-size Photograph of Bean Pods Showing Fungus Growth, and Large Black Sclerotia

Rust (*Uromyces appendiculatus*) is occasionally reported on lima beans. It appears on the leaves, especially the under surface, and also on the stems, as small brown circular spots which become black late in the season. This disease has thus far been of very little importance in New Jersey.

It can be controlled by spraying with Bordeaux mixture.

Blight (*Bacterium phaseoli*) attacks both field and garden varieties of beans and also the lima bean. On the leaves it appears as irregular, water-soaked spots with distinct yellow or red borders. These spots increase in size but finally become dry and brittle. On the pods it appears as slightly raised water-soaked pustules which become irregular in size and shape, amber-colored, and finally dry and shrivelled. On the stems it causes spots somewhat resembling the spots caused by anthracnose on the stems.

There is no satisfactory control, except the use of seed from healthy plants.

Leaf and Pod Spot (*Ascochyta pisi*). This is a fungous disease of the pea, bean and other crops which is quite common and the cause of greater losses than are realized by most growers. The spots which appear on leaf and pod are variable in size, gen-

erally circular, and of a yellowish color with a brown margin. The earlier the attack, the greater is the loss. As a rule it does not destroy the plant but decreases the yield in accordance with the prevalence of the disease. Seeds from diseased plants do not germinate well, and their seedlings frequently show damping-off.

The only satisfactory treatments are crop rotation, seed selection and the use of resistant varieties.

Pea Root Rots. These diseases are very destructive throughout the state, especially in the southern part and cause very heavy losses. It has been demonstrated that the organisms causing the trouble are carried from year to year in the soil. Therefore, it is advisable to rotate the crops as much as possible. These diseases are the subject of special studies being made by this department.

Other Diseases. There are many other minor diseases of beans and peas. At any time one of these may become important, because of some unusual weather or soil condition which cannot be foreseen.

Note—For methods of making and using Bordeaux mixture see Circular 48, New Jersey Agricultural Experiment Station.